Chapter 3 – The Science Content Standards

This chapter incorporates the science content standards, providing elaboration of the science underlying the standards and outlining activities that are consistent with the objectives of the standards. It is important to bear in mind that the activities included in this chapter are examples of ways in which the standards may be approached. They are not to be interpreted as requirements for the science classroom or for inclusion in instructional materials, thus explaining the frequent use of verbs such as *can*, *may*, and *should*.

The science content standards are set forth in terms of what "students know." Therefore, mastery of an individual standard is achieved when students have actually learned the fact, skill, concept, principle, or theory specified. Mastery does not occur simply because students have received a particular explanation or participated in a particular activity.

Introduction to Elementary School Science Education (Grades K-5)

The elementary school science program provides the foundational skills and knowledge students will need in middle and high school. Students are introduced to facts, concepts, principles, and theories organized under the headings of physical, life, and earth sciences. They learn essential investigation and experimentation skills that will continue to be developed through high school. Elementary school students respond positively to well-structured activities and expository reading materials that connect the world around them to the science content. Students raise questions, follow their curiosity, and learn to be analytical. They are encouraged to establish a practice of open and honest expression of ideas and observations, learning to listen to and consider the ideas and observations of other students. Science teaching and learning needs to be an enjoyable adventure for both teachers and students.

This enjoyable adventure includes the school library-media center as a natural partner in science teaching and learning. The books and other resources available in the school library enhance and expand an interest in and understanding of science. When the school library-media center is appropriately staffed with a credentialed library-media teacher, information literacy instruction can be integrated into regular science instruction.

Safety is always a first consideration in the design of teacher modeling and demonstration, investigation and experimentation, and science projects, both at the school site and away from school. Teachers must be familiar with the Science Safety Handbook for California Public Schools (1999). It contains specific and useful information relevant to classroom teachers of science. Observing and promoting safe practices is a legal and moral obligation for administrators, teachers, parents (guardians), and students. Safety must be taught. Scientists and engineers in universities and industries are required to follow strict environmental health and safety regulations. Knowing and following safe practices in science is part of understanding the nature of science and scientific enterprise.